

Applicant : Vladimir Andreevich Bushuev  
Serial No. : 09/649,431  
Filed : August 25, 2000

d) Remarks:

Reconsideration and allowance of the present application in view of the foregoing amendments and accompanying remarks are respectfully requested.

Claim 3 was pending. In this Amendment claim 3 is being cancelled and claims 6 and 7 are being added. Claims 6 and 7 are now pending.

Amendments to the specification and claims are being presented in the manner specified in the Notice dated January 31, 2003 entitled "Amendments in a Revised Format Now Permitted".

In the Office Action dated June 21, 2002, the Examiner stated that applicant has improperly amended the claims in that the remaining claim is not numbered. The Examiner stated that the single claim has been treated as claim 3 in view of the marked-up copy of the claims. The Examiner stated that correction is required. In response, applicant has cancelled this claim.

In the Office Action, the Examiner objected to claim 3 because of the following alleged informalities: the phrase "it can repeatedly passes" is allegedly improper grammar. The Examiner suggested amending the claim to read either "it can repeatedly pass" or "it repeatedly passes". The Examiner stated that appropriate correction is required. In response, applicant has cancelled this claim.

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The Examiner stated that claim 3 continues to be rejected under 35 U.S.C. 102(b) as being anticipated by Dinulescu (US 4,265,732) as presented in paragraph 4 of Paper No. 7.

The Examiner stated that Applicant's arguments filed March 7, 2002 have been fully considered but they are not persuasive. The Examiner stated that applicant argued that it is impossible for reactant flow to repeatedly flow through blades unlike the cavity of the present claim. The Examiner stated that respectfully she disagrees with applicant, and that applicant has not provided any evidence from the patent itself nor in the form of a declaration, but merely stated that flow cannot repeatedly pass through blades.

With respect to the cavity configuration, the Examiner notes that the cavity configuration is only described in the specification as an "annular cavity" (p. 10, line 33 of the substitute specification). The Examiner stated that Dinulescu illustrates a cavity which is also annular (see fig. 2a).

In response to applicant's argument that the cavity of Dinulescu is to configured for repeated reactant flow, the Examiner stated that a recitation of the intended use of the claimed invention must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. The Examiner stated that structure is capable of performing the intended use, then it meets the claim.

The Examiner stated in a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art, citing *In re Casey*, 152 USPQ 235 (CCPA 1967) and *In re Otto*, 136 USPQ 458, 459 (CCPA 1963).

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In response to the Office Action, new claims 6 and 7 are being presented and claim 3 has been cancelled. Support for claims 6 and 7, may be found, inter alia, in Fig. 3 as originally filed ("ring-like shaped cavity") and in page 10, lines 7,8 and 17, 18 of originally filed application ("a ring vortex flow"). The presently claimed invention provides a ring-like shaped cavity which allows creation of a ring vortex flow of reactants inside the cavity. This ring vortex flow ensures practically instant heating hydrocarbons feed to pyrolysis temperature.

This in turn ensures suppressing secondary reactions and therefore a high output of low-molecular olefins is achieved. Such a ring vortex flow is neither taught nor suggested in the cited Dinulescu reference. This reference has an "annular" cavity instead of "ring-like shaped cavity" according to the claimed invention.

The Dinulescu reference does not teach or suggest the use of a ring vortex flow to increase output of low-molecular olefins, which is apparent after study of Figure 2b of this reference. The distribution of temperature through reactor length is not equal. If the temperature distribution is not equal through the reactor no ring vortex flow is presented. Therefore quick heating of hydrocarbons feed to pyrolysis temperature is not achieved at all.

The secondary reactions are not suppressed and therefore a high output of low-molecular olefins is not achieved.

In the Office of June 21, 2002 the Examiner has rejected claim 3 as allegedly not novel in view of the Dinulescu reference (Figure 2a). The position of the Examiner is that: (1) Applicant has not proved that flow in the Dinulescu reactor can not repeatedly pass through blades; and (2) The working cavity configuration is only described

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in the present specification as an "annular cavity", and Dinulescu illustrates a cavity which is also annular (see Figure. 2a of patent).

In reply to the point (1), applicant states that, in order for it to be possible to repeatedly pass reactant flow in rotary blading reactor through rows of working and stationary blades, the existence of a backflow in such reactor is necessary. In other words, the mass flow rate of this backflow must be significantly greater than mass flow rate of supplied feedstock. The reactor of Dinulescu (Fig. 2a) is combination of multistage axial compressor and of axial turbine of conventional structure. A predestination of multistage axial compressors is continuous pumping of fluids. In accordance with the predestination these compressors are always designed so that axial velocity of flow in annular gap between rotor and stator has a single direction, and possibility of the backflow is absent (see, for example, N. A. Cumpsty, Compressor Aerodynamics, Department of Engineering University of Cambridge, Longman Group UK Limited 1989). This is shown in Fig. 3.3 of the said book, (copy enclosed) from which it follows that backflow of pumped fluid in the annular gap between the rotor and stator of axial multistage compressor of conventional design is absent. Constancy of mass flow rate of pumped fluid from row to row of blades indicates also on absence of the backflow of pumped fluid in axial multistage compressor of conventional design (see sections 2.4). So reactor of Dinulescu, as it is described in his patent and shown in Figure 2a, can not provide reactants recirculation in working cavity and consequently can not provide performance of the intended use (b) (page 5, lines 4-5 of primary specification in USA).

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In reply to the point (2) of the Examiner, applicant states that the working cavity of the reactor of the claimed invention is defined by the combination of following features:

- a) this cavity is ring-shaped;
- b) in this cavity blades of working wheel are located;
- c) in this cavity directing stationary blades are located;
- d) elements forming the working cavity (hollow housing, bladed working wheel, cascade of stationary blades) are configured so, that when working wheel is rotated in this cavity a ring vortex flow is created; and
- e) nipple for supplying feedstock and nipple for carrying-off cracked gas are communicated with this cavity.

From figures 2 and 3 of specification it is clear that the wording "ring-shaped cavity", used in the feature (a), in context of the specification, means a cavity having the form of a toroid, that is to say the form of geometric body to look like a torus.

The feature (d) is functional. Taking into consideration that for blading chemical reactors this feature (d) is new, applicant considers it desirable to introduce it into the combination of features characterizing working cavity of the reactor as set forth in the new claims 6 and 7 presented above.

In view of the foregoing, applicant believes that the present claims distinguish patentably over the cited reference, and allowance is earnestly solicited.

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If a telephone interview would be of assistance in advancing prosecution of the subject application, the undersigned attorney invites the Examiner to telephone him at the telephone number provided below.

No fee is deemed necessary in connection with the filing of this Amendment. If any additional fee is necessary, authorization is hereby given to charge the amount of any such fee to Deposit Account No. 03-3125.

Respectfully submitted,

I hereby certify that this correspondence is being deposited this date with the U.S. Postal Service with sufficient postage as first class mail in an envelope addressed to:

Assistant Commissioner of Patents,  
Washington, D.C. 20231.

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